After Sales Technical Documentation

NHA–2/4 SERVICE SOFTWARE INSTRUCTIONS

Original, 33/96

NMP Part No. 0275101

AMENDMENT RECORD SHEET

Amendment Number	Date	Inserted By	Comments

NHA–2/4 SERVICE SOFTWARE INSTRUCTIONS

Contents

Introduction	Page 5
General	Page 5
Required Servicing Equipment	Page 5
Mechanical Connections	Page 6
Start Up Procedure	Page 7
Service Software Menu Structure	Page 8
Using Menus	Page 9
Menu Bar	Page 9
Windows	Page 10
Dialog Boxes	Page 11
File Selection Dialog Box	Page 12
Service Software Menu Functions Overview	Page 13
File Menu	Page 13
Open	Page 13
Save	Page 13
Save As	Page 13
Edit	Page 14
Exit	Page 14
Tuning Menu	Page 15
Initialize Local Mode	Page 15
Battery Reference	Page 15
Reference Charge Voltage	Page 15
VCO	Page 15
VCXO	Page 15
TX Power Level Tuning	Page 15
Deviation Tuning	Page 15
RSSI Reference Value	Page 15
Tuning Values	Page 16
Testing Menu	Page 16
Phone Mode – Local/System	Page 16
Initialize Local Mode	Page 16
Quick Testing/Setup	Page 16
Audio Controls	Page 17
Signalling Control	Page 17
RX & TX VCO Checking	Page 18
ADC Reading	Page 18
Display Test and Light Control	Page 19

Reading Error Codes Page 19
SINAD & XEAR level Page 20
Dealer Menu Page 21
Subscriber (NAM) Data Page 21
Short Code Memory Page 24
NAM1 SID Screening / NAM2 SID Screening Page 25
User Menu Settings Page 26
Phone Identification Page 26
Warranty Information Page 27
Help Menu Page 27

Introduction

General

The Service Software is specially designed to facilitate the servicing of fifth generation cellular telephones.

The software can be used to control the phone according to the user's requirements merely by entering commands via the keyboard / mouse of a PC connected to the phone.

This section refers to AMPS Service Software Version 1.00. NMP After Sales will notify service personnel about future upgrades via Technical Bulletins. Software upgrades will be available from your local NMP outlet.

Required Servicing Equipment

- Computer: IBM PC / AT or compatible with one unused serial port (COM1 or COM2*), one parallel port (LPT1), hard disk recommended.
- Operating System: DOS Version 3.3 or later
- 500 kB free memory under DOS
- Display: Any 80–character text display
- PC Locals program: LSA–3K (product code 0193697) for 3.5" disk or LSA–3L (product code 0193698) for 5.25" disk.
- Software Protection Key PKD–1 (product code 0750018)
- M2BUS interface cable DAU–4S (product code 0730057)

*) Note: A number of PC's of an older generation use the Intel, National Semiconductor, or United Microelectronics IC 8250 as the serial port UART. This is a comparatively inefficient circuit for current purposes and does not necessarily support the M2BUS adapter at 9600 baud. The newer UART's NS16450 and NS16550AF of National Semiconductor offer solutions for these problems.

Mechanical Connections

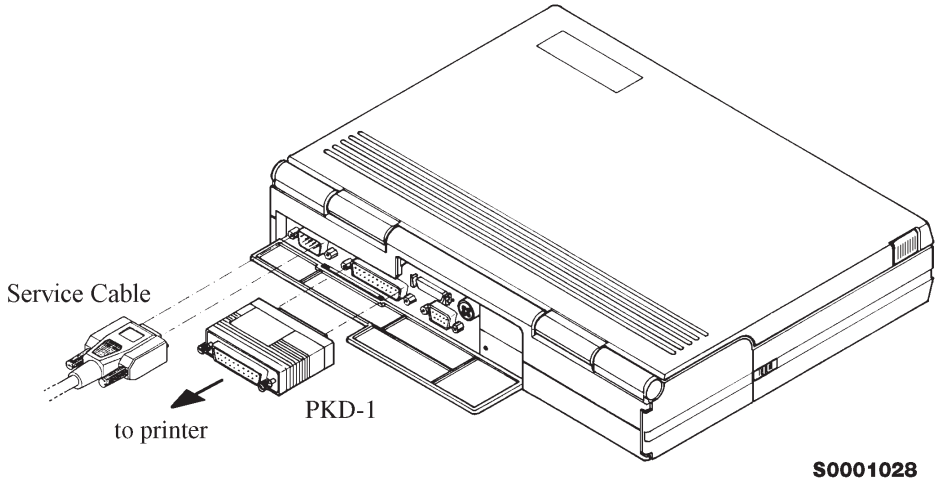
Caution: Ensure that you have switched off the PC and the printer before making connections !

Caution: Do not connect the PKD–1 to the serial port. This could damage the PKD–1 !

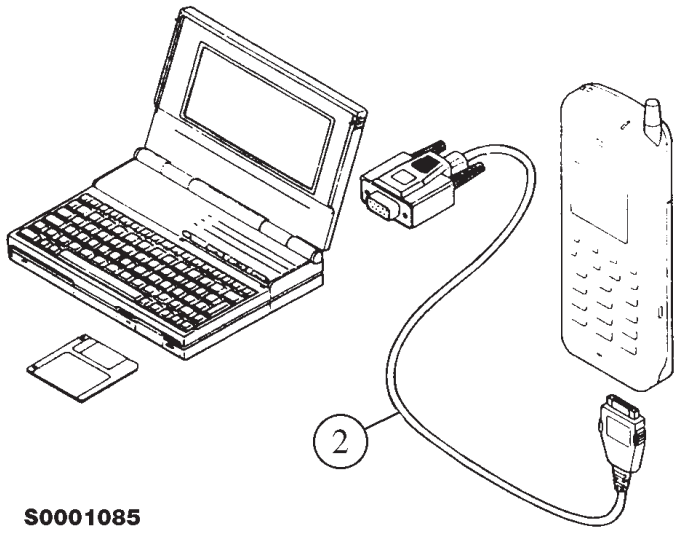
The software controls the phone via a separate adapter connected to the serial port of the PC and to the telephone's M2BUS (DAU–4S and XCM–1).

Attach the protection key PKD–1 to parallel port one (25–pin female D–connector) of the PC. When connecting the PKD–1 to the parallel port be sure that you insert the PC end of the PKD–1 to the PC (male side). If you use a printer on parallel port one, place the PKD–1 between the PC and your printer cable.

The PKD–1 should not effect devices working with it. If some errors occur (errors in printing are possible) please try printing without the PKD–1. If printing is OK without the PKD–1 please contact your dealer. We will offer you a new PKD–1 in exchange for your old one.



Attach one end of the M2BUS interface cable, DAU–4S (2), to the PC serial port and the other end to the bottom connector of the phone.



Start Up Procedure

Start the phone by pressing the power–on button of the handset. Switch PC power on.

To start the software on diskette, proceed as follows:

1. Insert service software disk into drive A of your PC
2. Log into drive A: **type *A:* and press *Enter***
3. Start service software: **write *NHA2SERV* and press *Enter***

To start the software on hard disk (if installed), proceed as follows:

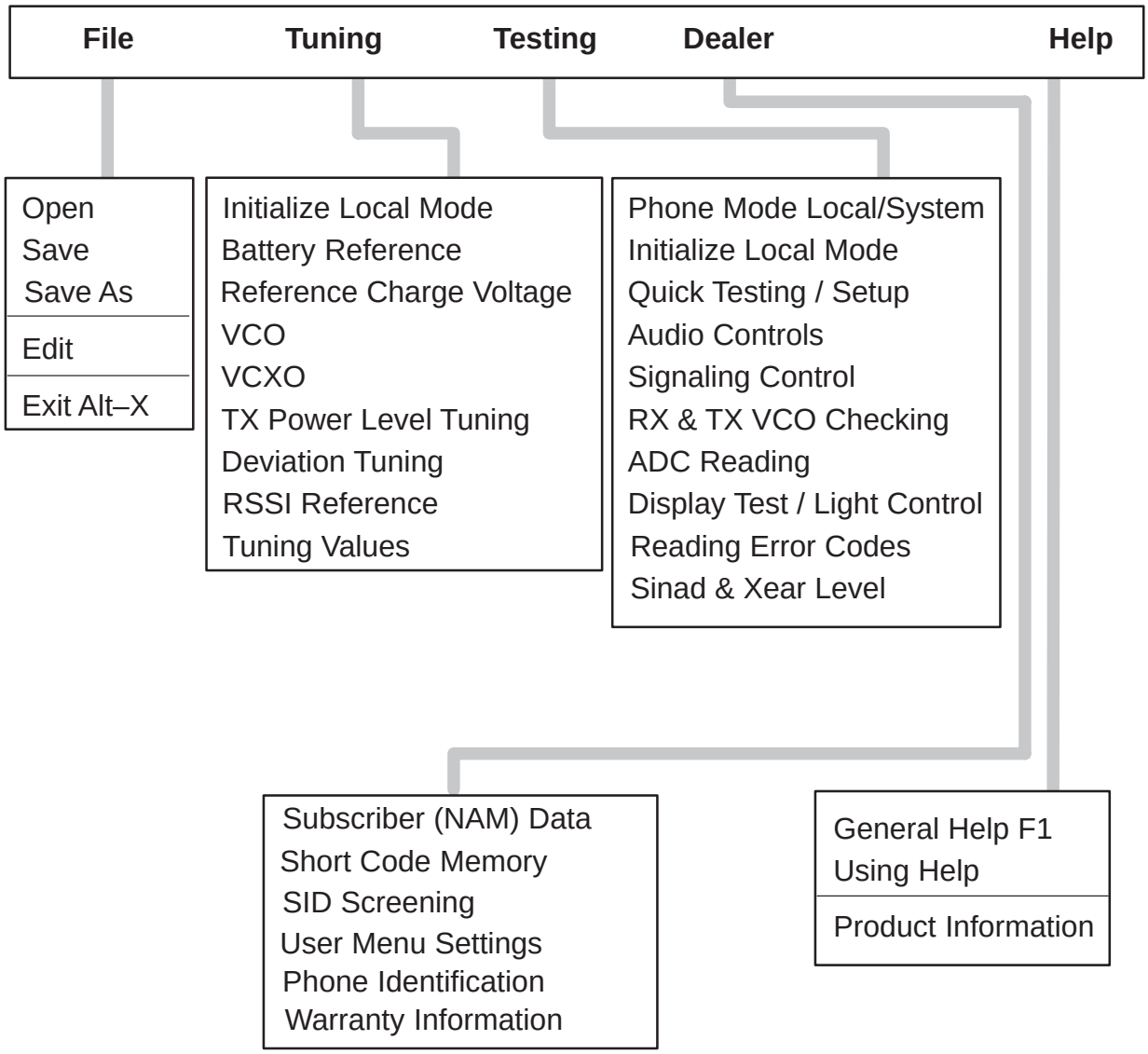
1. Log into drive C: **type *C:* and press *Enter***
2. Start service software: **write *NHA2SERV* and press *Enter***

Note: Type *NHA2SERV /? + Enter* if you want see all starting options.

The service software starts by loading the configuration file. After it has been loaded, a menu bar is shown at the top line of the display. Refer to section ”Using Menus” for how to proceed through the menus. In the middle of the display will be a Phone Identification Window which displays some basic information about the connected phone.

Press *Enter* to close the Phone Identification Window.

Service Software Menu Structure



Using Menus

There are three visible components to service software: the menu bar at the top, the window area in the middle, and the status line at the bottom of the screen. Many menu items also offer dialog boxes. Although there are several different ways to make a selection in service software, they access the same commands and dialog boxes.

Menu Bar

The menu bar is the primary access to all the menu commands.

Here is how you choose menu commands using the keyboard:

– Press *F10* to make the menu bar active; the next thing you type will relate to the items on the menu bar.

– Use the ← → arrow keys to select the menu you wish to display and then press *Enter*. As a shortcut to this step you can just select the highlighted letter of the menu title. For example, when the menu bar is active, press *F* to move to and display the File menu. At any time press *Alt* and the highlighted letter (e.g. *Alt* + *F*) to display the menu you want.

– Use the ↑ ↓ arrow keys to select command from the menu you have opened and press *Enter*. As a shortcut you can just press the highlighted letter of the menu command.

At this point service software either carries out the command, displays a dialog box, or displays another menu.

There are two ways to choose commands with a mouse:

– Click the desired menu title to display the menu and click the desired command.

– Drag straight from the menu title down to the menu command. Release the mouse button on the command you want. If you change your mind, just drag off the menu; no command will be chosen.

Service software offers a number of quick ways to choose menu commands. The click–drag method for mouse users is an example. From the keyboard, you can use a number of keyboard shortcuts (or 'hotkeys') to access the menu bar, choose commands or work with dialog boxes. You need to hold down *Alt* while pressing the highlighted letter when moving from input box to a group of buttons or boxes.

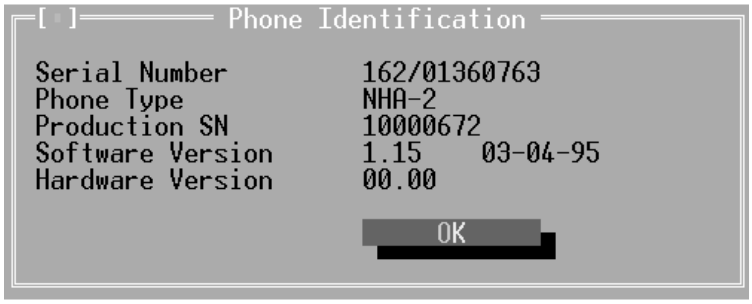
Windows

Some of the actions you see and do in Service Software happens in a window. A window is a screen area that you can open, close, and move.

Most of the windows have these things in common:

– a title bar
– a close box

The following figure shows a typical window:



The close box of a window is the box in the upper left corner. Click this box to quickly close the window.

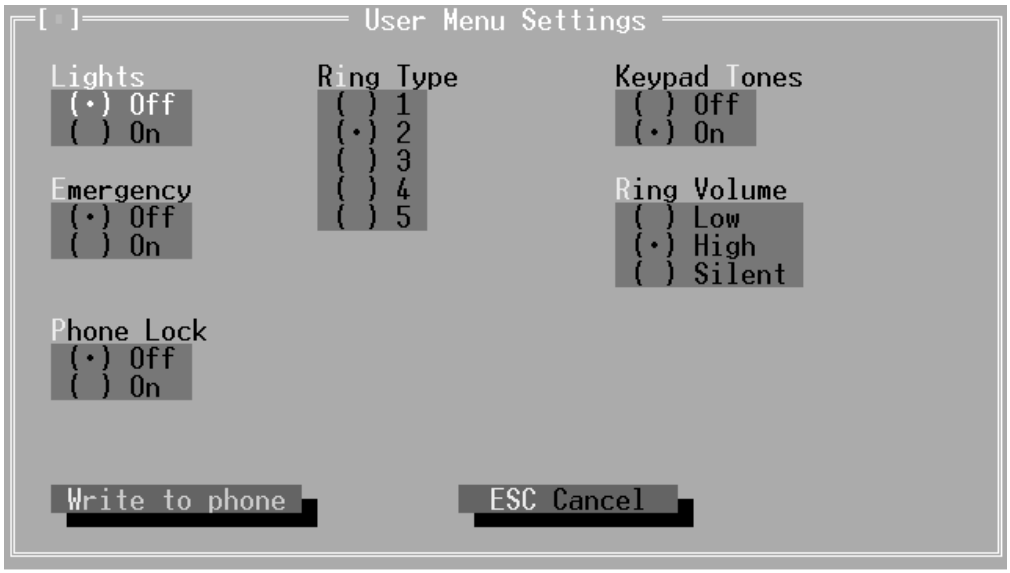
The title bar, the uppermost horizontal bar of a window, contains the name of the window. You can drag the title bar to move the window around.

Dialog Boxes

Most of the menu commands lead to a dialog box. Dialog boxes offer a convenient way to view and set multiple options. They are typically used for making settings or performing some action where the phone must be in a certain state and all other actions must be denied. When you are making settings in a dialog box, you work with five basic types of on–screen control:

– action buttons
– radio buttons
– check boxes
– input boxes
– list boxes

Dialog boxes also have similar features to windows; title bar and close box. Below is a sample box which lists some of these features:



This dialog box has two standard buttons: *Enter* and *Esc*. If you choose *Enter*, the choices in the dialog box are accepted. If you choose *Esc*, nothing changes and the dialog box is exited. *Esc* is always a keyboard shortcut to exit the dialog box.

If you are using a mouse, click the dialog–box button you want. When you are using the keyboard, press *Alt* and the highlighted letter of an item to activate it. Press *Tab* to move forwards or backwards from one item to another in a dialog box. Each element is highlighted when it becomes active.

Radio buttons are like car–radio buttons. They arranged in groups, and only one radio button in a group can be selected at any one time. To choose a radio button, click it or its text. From the keyboard, select *Alt* and the highlighted letter or press *Tab* until the group is highlighted, and then use the arrow keys to choose a particular radio button. Press *Tab* again to leave the group with the new radio button chosen.

Check boxes differ from radio buttons in that you can have any number of check boxes checked at any time. When you select a check box an X appears in it to show you it is on. An empty box indicates it is off. To change the status of a check box, click it or its text, press *Tab* until the check box is highlighted and then press the *Spacebar* or select *Alt* plus the highlighted letter.

If several boxes apply to a topic, they appear as a group. In this case tabbing moves to the group. Once the group is selected use the arrow keys to select the item you want and then press *Spacebar* to check or uncheck it.

Input boxes let you type in text. Most basic text–editing keys work in the text box (for example arrow keys, *Home*, *End*, *Backspace*, *Del* and *Ins*). If the contents of the input box are highlighted (typically when you first select it) and you start typing in new data, the old data is erased.

A final component of some dialog–boxes is a list box, which lets you scroll through and select from variable length lists without leaving a dialog box. You make list box active by clicking it or by choosing the highlighted letter of the list title (or press *Tab* until it is highlighted). Once a list box is displayed, you can use the scroll box to move through the list or press the up or down arrow from the keyboard.

File Selection Dialog Box

The File–Selection box offers you a way to select the file you want to open for reading or writing. Below is an example of such a box:

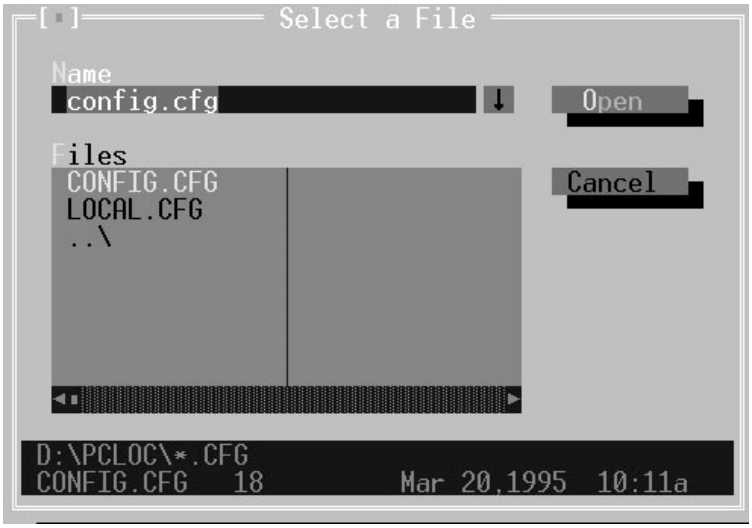


Figure 1.

Service Software Menu Functions Overview

The Service Software is divided into 5 main blocks: File, Tuning, Testing, Dealer, and Help.

File is used to save all parameters to a configuration file to enable set up as required. It is possible to change the PC settings to a configuration file as well as the default parameters of the phone such as channel number, transmitter on/off, audio settings, etc. It is also used to edit default settings for NAM information and SID screening information.

Tuning contains the functions required for tuning the phone.

Testing contains the functions required for testing the phone in Local mode.

Dealer is used to edit all NAM and other user information. It also contains user data transfer programs to be used in case a faulty phone should be replaced with a new unit.

Faultlog menu contains information about the repaired phone.

Help contains all the help information for using Service Software.

File Menu

The file menu contains commands related to file operations. It lets you save and edit configuration files and also exit Service Software.

Open

The File/Open command displays a File–Selection dialog box for you to select a configuration file to open. These files contain Local mode setup. You can edit these values with File/Edit command. Once the file is opened the new values take effect.

Save

The File/Save command saves the previously opened configuration file. If no file has been opened, Save As command is performed instead.

Save As

The File/Save As command lets you save the configuration file under a different name, in a different directory or under a different drive. When you choose this command you will see the File–Selection dialog box for Save File As.

Edit

The File/Edit command opens a dialog box for editing the configuration file contents. A dialog box would look like the following example:

At the top of the dialog box you can see the name of the current configuration file. Below that are default Testing/Local mode settings. Select the value you want to change using 'hotkeys' (*Alt* + letter), clicking with a mouse, or using tabulator keys, and then type in the new value. Accept the changes by pressing *Enter* or abandon by pressing *Esc* (or click the corresponding button).

Exit

The File/Exit command exits Service Software. Before exiting a confirmation box is
displayed. Pressing *Enter* quits the program and *Esc* cancels exiting.

Tuning Menu

This menu contains the commands needed for tuning the phone. Choosing tuning opens up a sub–menu from where the desired tuning can be selected. After you select a tuning from the sub–menu, a tuning dialog box will be opened, and all necessary settings for the phone will be done automatically.

Note: Service technicians are strongly advised to use the separate service instructions booklet when tuning the handportables.

Note: If you wish to only view and not change the tuning parameters, press Esc to exit the screen.

Initialize Local Mode

This command reactivates the locals mode of the phone.

Battery Reference

This consists of tuning the reference value for the battery.

Reference Charge Voltage

This consists of tuning the reference charge voltage.

VCO

This command is used to tune the VCO of the phone.

VCXO

This command is used to tune the VCXO frequency of the phone.

TX Power Level Tuning

This command is used to tune the phone’s TX power levels. When selected, the transmitter will be switched on at power level 7 on middle channel (default: channel 380).

Deviation Tuning

A number of deviation tunings are grouped together in this command. They are, however, still tuned independently of each other.

RSSI Reference Value

This consists of tuning the reference value for the RSSI meter. It is carried out without an external signal using noise.

Tuning Values

With this command you can save the read Tuning Data from the EEPROM, and save factory default tuning values to phone. You can read/save those values from/to file as well.

Testing Menu

The Testing Menu allows the Service Technician to switch a phone to Local mode in order to attempt to simulate a reported fault or configure a phone to test a certain parameter. It allows the technician complete control over internal and external audio, and the RF settings.

When Testing is selected, the phone is placed into Service mode automatically. This is known as Local mode. Unless the user changes this configuration, using File, the phone receiver is tuned to Channel 380; the Transmitter synthesizer is also tuned to Channel 380 but with the PA switched off.

Phone Mode – Local/System

This allows you to change from Local Mode to normal System Mode and back to Local Mode.

Initialize Local Mode

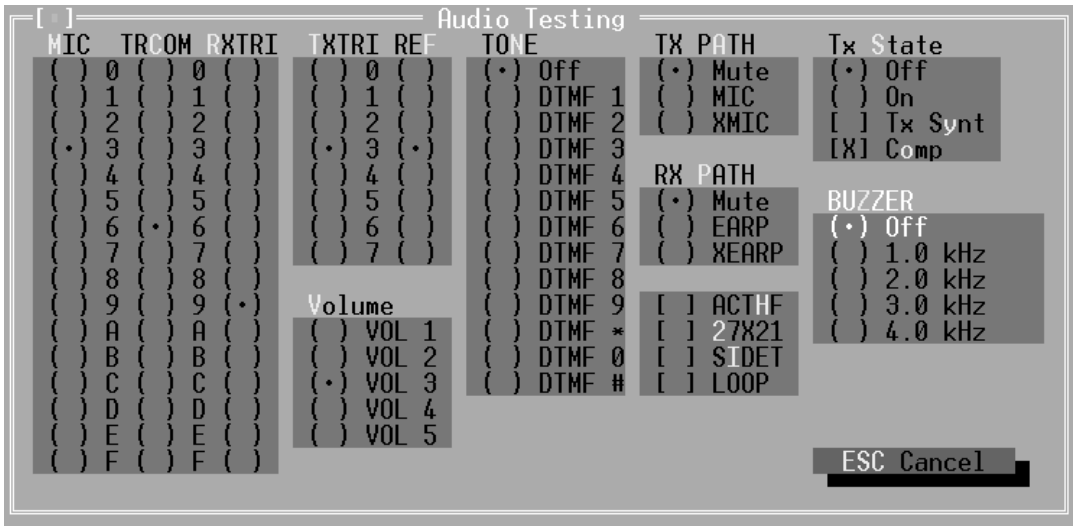
This allows the phone to be reset into Local mode. The text ’Local’ will appear in the phone’s display.

Quick Testing/Setup

This command opens a Window allowing the user full control over the channel the phone is tuned to; the transmit power state; and access to some simple audio routing and signal switching.

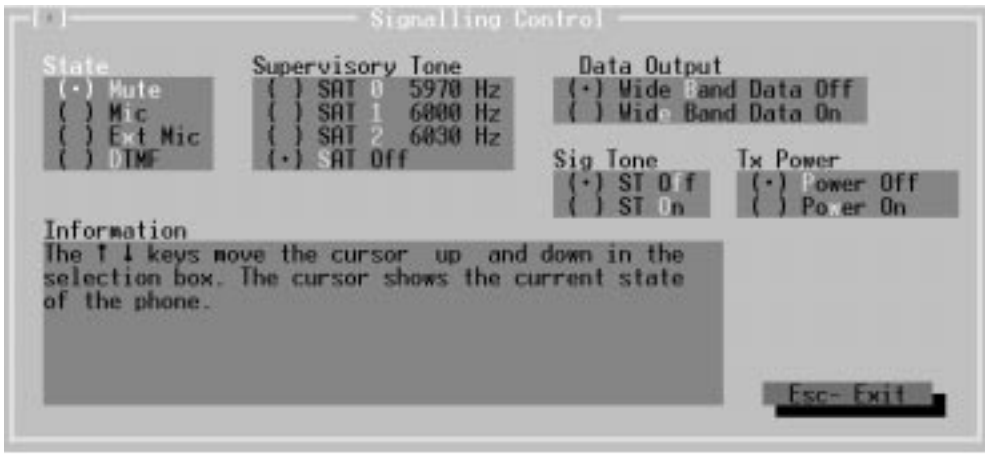
Audio Controls

This command allows you to test all possible audio paths in and out of the audio processing device including XMIC, XEAR and DTMF.



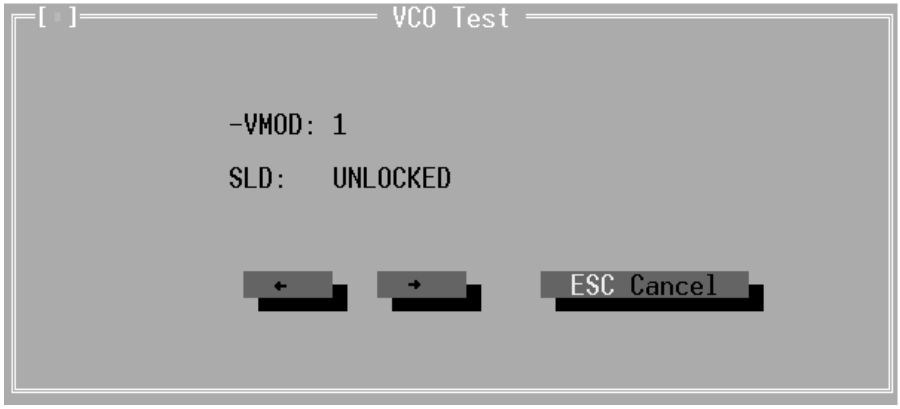
Signalling Control

This command allows the setting of the following signalling parameters. The * symbol in each column indicates the phone's present state.


Signalling Control
State
(•) Mute
( ) Mic
( ) Ext Mic
( ) DTMF
Supervisory Tone
( ) SAT 0 5970 Hz
( ) SAT 1 6000 Hz
( ) SAT 2 6030 Hz
(•) SAT Off
Data Output
(•) Wide Band Data Off
( ) Wide Band Data On
Sig Tone
(•) ST Off
( ) ST On
Tx Power
(•) Power Off
( ) Power On
Information
The ↑ ↓ keys move the cursor up and down in the selection box. The cursor shows the current state of the phone.
Esc- Exit

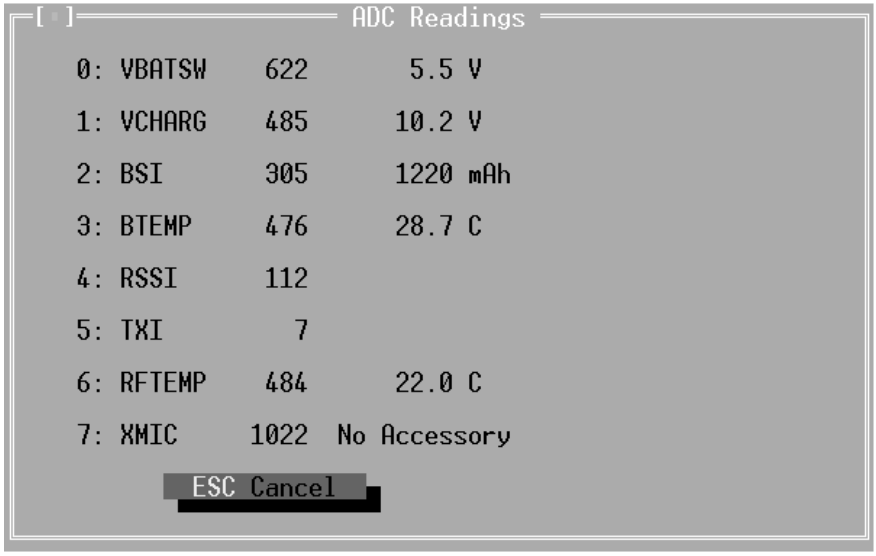
RX & TX VCO Checking

This command will check that RX VCO and TX VCO synthesizers will lock across the required bandwidth.



ADC Reading

This displays a table showing the following readings of the A/D converters.


ADC Readings
0: VBATSW 622 5.5 V
1: VCHARG 485 10.2 V
2: BSI 305 1220 mAh
3: BTEMP 476 28.7 C
4: RSSI 112
5: TXI 7
6: RFTEMP 484 22.0 C
7: XMIC 1022 No Accessory
ESC Cancel

Item:	Name:	Function:
0	VBATSW	Battery voltage
1	CHRGMON	Charge voltage
2	BTEMP	Battery temperature
3	BSI	Battery size indication
4	RSSI	Received Signal Strength
5	TXI	Transmit power monitor
6	RFTEMP	RF temperature
7	XMIC	External microphone line state

Display Test and Light Control

This enables checking of the operation of the display segments and the phone back–lighting.

Display Test:

– Clear Display
– Fill pattern 1 switches on all icons and fills alphanumeric area with a pattern
– Fill with pattern 2 switches on all icons and fills alphanumeric area with a different pattern
– Fill with pattern 3 switches on all icons and fills alphanumeric area with a different pattern

Lights:

– On switches on all back–lighting
– Off switches off all back–lighting

Reading Error Codes

This command is used to read error codes from phone. The following error codes are possible:

– No Error Detected
– Error in EEPROM id field
– Error in EEPROM RF tuning parameters
– Error in EEPROM audio tuning parameters
– Error in EEPROM device/charge tuning parameters
– Error in checking the serial number
– Error in checking modem circuit
– Error in checking audio circuit
– Invalid Error Code Received

SINAD & XEAR level

This command is used to test SINAD and XEAR level.

Measure RX SINAD

– Connect an RF SIGNAL GENERATOR to the phones antenna connector and set up the instrument as follows:
  • FREQUENCY to RX frequency of the current middle channel
  • OUTPUT LEVEL: –116 dBm.
  • MODULATING FREQUENCY: 1 kHz.
  • DEVIATION: 8.0 kHz.

– Connect a SINAD meter to the XEAR output of the phone and check that the Psophometrically weighted SINAD measured is greater than 12 dB.

Measure XEAR:

– Increase the RF signal level to –50 dBm and change the deviation to 2.3 kHz.

– Now check that the audio signal level measured at XEAR is in the range of 35...70 mV_{RMS}.

Dealer Menu

Selecting Dealer will bring up a sub–menu as shown below:

– Subscriber (NAM) data
– Short code memory
– User menu settings
– User data transfer
– Phone identification
– Warranty information

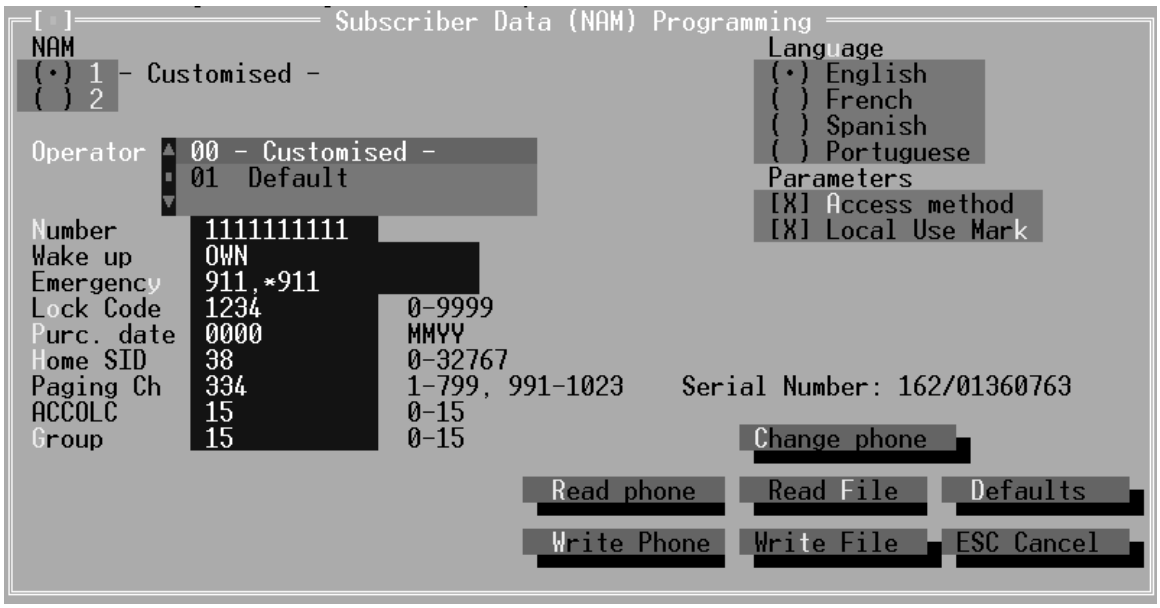
Note: If NAM password differs from factory password it is asked when entering subscriber data, user data transfer or warranty information menu items.

Subscriber (NAM) Data

This can be used to program all the Subscriber Data and Common NAM Data information into a telephone. This can also be programmed through the phone's keypad.

Note: If you wish to only view and not change the NAM information, press Esc to exit the screen.

Any NAM in the phone can be read from/written to by selecting either 1 or 2. When a selection is made, all the NAM information displayed on the PC is updated. Basic information displayed next to 1/2 is operator name (if the phone has been programmed using the customization feature), and Subscriber Number (MIN–P).



From this example it can be seen that NAM 1 has been programmed. The ESN of the phone is also clearly displayed.

Dealers are strongly advised to use the customisation feature. For any operator they could store, as a default, the following parameters:

Home System Identification (SIDH)

– This number is used to define the primary traffic area of the phone. The number contains the country code, system bit information and the area code.

Local Use Mark

– This option is used to determine whether the phone must respond to local control messages sent from the exchange.

Access Method (EX)

– This is used to define the method of sending the phone identification data (x = country code in use).

Initial Paging Channel (IPCH)

– This number is used to identify the primary traffic channel of the phone. Typically 333 for system A and 334 for system B.

Access Overload Class (ACCOLC)

– This number is used to identify which overload class the phone belongs to. Numbers 0–9 corresponds to normal phone class (typically 0 + last digit of MIN).

Group Identification Mark (GIM)

– This is used to identify the group of the phone.

Purchasing Date

– Purchasing date is used for warranty purposes. This location should be programmed when the phone is delivered to the customer. This location can be programmed only once, when the contents of the location is 0000. After it is programmed, it can be read but not changed any more.

You are also able to store:

Language

– Four languages can be selected (English, French, Spanish and Portuguese).

Emergency Numbers

– A few emergency numbers can be defined.

Lock Code

– A four digit individual lock code can be defined.

Wake Up Message

– This option enables defining for example the name of the phone owner into the power up display. If the name is not entered here, the subscriber’s number is shown.

NAM Programming

The process for programming a NAM with this method is as follows:

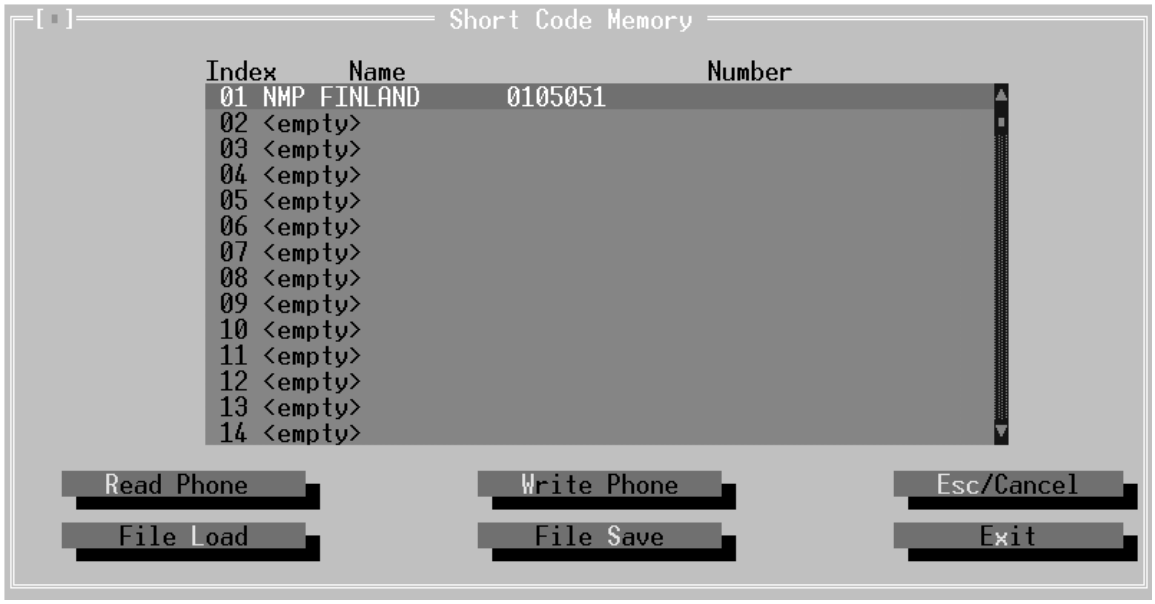
1. Select NAM 1 or 2
2. Select Operator – scroll through the available defaults using the arrow keys until you find the desired default. All the default information will be displayed on the PC screen
3. Select Number and program the new subscriber number using the normal text editing keys
4. Select Wake up and program the new Wake up message using the normal text editing keys. To help with the message alignment, the phone's display will constantly be updated during this process
5. Select lock and program the new lock code using the normal text editing keys
6. Select *Enter* to save to EEPROM.

Alternatively, the user is able to program each individual parameter if they choose not to use the customization feature.

Short Code Memory

Selecting Dealer/Short Code Memory opens the short code memory dialog box. In this box, you can view and edit all memory locations of the phone. You can also store the information to a file and read information from a file. It is also possible to read short code memory files generated by other product's service software. The following Service Software supports this general file format.

The SCM editing dialog box is shown below:



In the editing dialog box, edit or type in a new name and number. You can change the field with the *Tab* key or clicking with a mouse. When this is complete you are able to accept the new values and return to the full SCM dialog box by pressing *Enter* or by clicking the corresponding button. *Esc* will cancel the operation.

In the SCM dialog box the following command buttons are available:

File Load (*Alt+L*)	Reads SCM data from a file. You can select a file to be loaded from the File selection dialog box.
File Save (*Alt+S*)	Writes SCM data to a file. You can select the file to write to from the File selection dialog box.
Read Phone (*Alt+R*)	Reads SCM data from the phone and updates it to the display.
Write Phone (*Alt+W*)	Writes SCM data to the phone. Before writing, the user is asked to confirm the writing.
Esc–Close	Closes the SCM programming dialog box. Click the button or press the *Esc* key.

NAM1 SID Screening / NAM2 SID Screening

Selecting Dealer/NAM1/2 SID screening opens a SID screening dialog box. In this box you can edit at maximum 32 SIDs (friendly/unfriendly) of the phone for both NAM1 and NAM2. You can also store the information to a file and read information from file.

The SID editing dialog box is shown below:

In the editing dialog box, edit or type in new SID (friendly/unfriendly). Friendly SID begins with a ‘*‘ character. Unfriendly SID begins with ‘#‘ character.

Explanations:

If SID screening is activated from menu of the phone, the phone will not accept channels of an unfriendly network. Only emergency calls are available in unfriendly network. The call is made in neutral network (not in SID screening list) only if friendly network is not available.

When this is complete you are able to accept the new values and return the full SID dialog by pressing ENTER or by clicking the corresponding button. ESC will cancel the operation.

In the SID dialog box, the following command buttons are available:

File Load (ALT+L)	Reads SID data from file. You can select a file to be loaded from the File selection dialog box.
File Save (ALT+S)	Writes SID data to file. You can select the file to write to from the File selection dialog box.
Read Phone (ALT+R)	Reads SID data from the phone and updates it to the display
Write Phone (ALT+W)	Writes SID data to the phone. Before writing the user is asked to confirm the writing.
ESC–Close	Closes the SID programming dialog box. Click the button or press ESC key.

User Menu Settings

By selecting Dealer/User Menu Settings you can view and change the following User Menu parameters:

- Lights
- Ring Volume
- Keypad Tones
- Ring Type
- Emergency
- One Touch Call
- Call Restrictions

You can move between these groups by using the *Tab* key and select a new setting using the arrow keys. Alternatively, you can click on the desired value with the mouse. Press *Enter* or click on the corresponding button with the mouse to save the new settings to the EEPROM or press *Esc* to exit the dialog box without altering the original values.

Phone Identification

By selecting this option you can see phone type and version.

Warranty Information

NOTE! Command Warranty Information contains also editing repair month though it is not transferred to other phone.

If phone is not Warranty Defective Phone, command asks if repair month is edited or warranty information transferred.

If phone is warranty defective phone, command automatically activates repair month editing.

1) Warranty Information contains contents of NAM (except NAM password), Short Code Memory, User Menu Settings, manufacturing month, purchasing month and warranty serial number.

Warranty serial number of exchange phone is:

a) serial number of original phone if warranty serial number of original phone is empty.

b) warranty serial number of original phone if warranty serial number of original phone is NOT empty.

2) Original phone will be made warranty defective phone when warranty information is transferred.

3) Warranty information will not be transferred to other phone if

a) Original phone is warranty defective phone (command goes automatically to ’edit repair month’ mode)

b) NAM password of original phone differs from that of exchange phone.

c) Exchange phone is warranty defective phone.

NOTE! In cases b) and c) you must immediately return the original phone to jig, to avoid making it to warranty defective phone!

Help Menu

Choose Help/Using Help to obtain information on how to use the help facilities.

This page intentionally left blank.